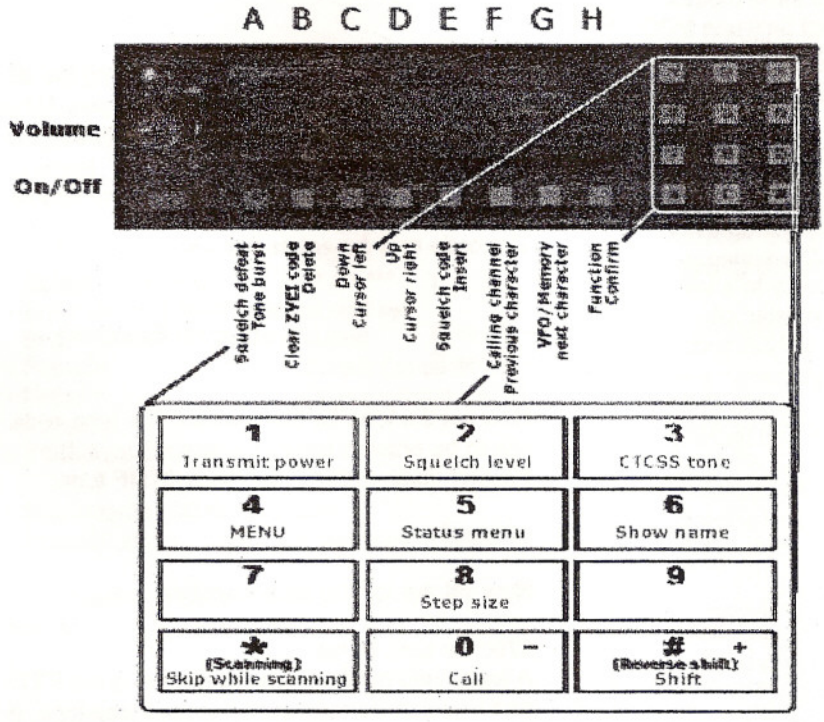
FM 1200 full keypad instructions

Keyboard Layout:



Main Functions:

Key(s):	Function:
0 1 2 3 4 5 6 7 8 9	Enter channel, frequency or number
*	Scanning
#	Reverse shift
E	Activate tone squelch (CTSS / 5-tone)
F	Go to Calling Channel
G	Switch between VFO and Memory
H	Select second function of next key

Second (alternate) function:

Key:	Function:
1	Adjust transmit power
2	Adjust squelch trip level
3	Select CTCSS tone
4	To MENU
5	To Status Menu
6	Show names with memory channels
8	Select step size
*	Exclude memory channel from scanning
0	Call
#	Shift + / – / off
E	Select tone squelch
F	Clear Priority Channel
G	Clear memory Channel

When the transceiver is switched on, the upper line of the display shows the current channel or the frequency. If a valid tone code is received, it is displayed in the lower right hand corner of the display. The lower display line shows an S (signal strength) meter in the form of a horizontal bar. This is called the normal state.

To activate the **second function** of a key, press the **H key**. The text 'Select Function" will appear. The second (alternate) function of the next key pressed is activated. Press **H** again to return to the normal state.

1. Select Frequency

The transceiver operates in one of three modes. Using the **G** button you may select between **VCO** and **Memory** mode. The third mode is the **Priority Channel** which may be switched on and off with the **F** key.

VCO mode
In VCO mode any frequency that complies with the selected step size (4) may be entered using the number keys on the keypad. The transceiver automatically rounds off the frequency to a valid entry. For example, of you want to listen at 435.012.500 MHz, at a step size of 12.5 kHz, all you need to do is enter '501':

435.---.--- → 435.0--.--- → 435.012.500

If a step size of 25kHz is used, entering '501' will cause the transceiver to round off to 435.000.000.

Memory mode
Starting from VCO mode up to 100 preset frequencies per bank may be stored in memory, see Heading 5. These frequencies may be selected when in Memory mode while it is also possible to assign names to channel frequencies. If no frequency has been assigned to the selected channel the transceiver produces an error beep and ignores the number entered.

Priority Channel mode
Provided a frequency has been assigned to the Priority Channel (see Heading 6), this feature allows you to change to this frequency at the flick of a switch. The Calling Channel may be instantly selected by pressing the **F** key.

2. Select CTCSS tone

It may be undesirable for every transmission to be heard on a certain frequency. A system called CTCSS is therefore used to pass only those transmissions containing a sub-audible tone of a specific frequency. In the receiver a CTCSS decoder is used to open the squelch and make the transmission (speech) audible when a valid CTCSS tone is detected.
The frequency of the CTCSS tone may be selected as follows:

	Display:
- Press **H**	(Select Function)
- Press **3**	(TX CT: **)

The lowest frequency is 67.0 Hz, the highest, 250.3 Hz. The quasi-value 'None' is available to disable CTCSS. Separate CTCSS frequencies may be used for TX and RX

3. Tone squelch

The squelch may be remain closed until a valid ZVEI 5-tone code is received. It is also possible to transmit a ZVEI 5-tone sequence at the start of every transmission.

Activate:
The tone squelch is activated by pressing the **E** key. When receiving, the yellow LED lights. When transmitting, the symbol 'T' appears behind the frequency.

Adjust:
The code may be set as follows:

	Display:
- Press **H**	(Select Function)
- Press **E**	(RX:)

Now set the tone for the squelch. The tone code has to be entered using the number keys. If a number flashes, this indicates a DTMF tone.

- Press **H**	(TX:)

Now set the tone to be transmitted.

1750 Hz tone burst
A tone burst is transmitted by pressing the PTT and Squelch Defeat buttons at the same time. The frequency of the tone burst may be adjusted in the Audio menu.

4. Select Step Size

	Display:
- Press **H**	(Select Function)
- Press **8**	(Step size: **)

The desired step size is selected by pressing the 0 and # keys (← or →). Confirm your selection by pressing any other key.

5. Store favourite channels

Up to 100 favourite channels per bank may be pre-set in the transceiver. A channel is stored as follows:

	Display:
- Select VCO mode	(43*.***.***)
- Enter the desired frequency and choose SHIFT and/or CTCSS if required	
- Press **H**	(Select Function)
- Press **G**	(Store in: xx)
- Select a number, if number has an arrow in front of it, it has been taken for another frequency. This is replaced.	(Store in: □xx)
- Press **H**	
- If desired, give the channel a name. See Heading 10 for text entry.	(Name:)
- Press **H** again	

See Heading 7 for the name display on/off function.

6. Storing Priority (PR) Channel

It is very useful, particularly in mobiles, to have a single button available to retrieve the Priority Channel. The Priority Channel frequency may be programmed as follows:

	Display:
- Select VCO mode	(43*.***.***)
- Enter the desired frequency and set SHIFT and/or CTCSS if required	
- Press H.	(Select Function)
- Press F.	(Calling Frequency?)
- Press H.	
- If desired, give the channel a name	
	(Name:)
See Heading 10 for text entry.	
- Press H again.	(Processing)

See Heading 7 for the name display on/off function.

7. Name display on/off

Names may be assigned to memory channels. The displaying of the name may be switched on and off, as follows:

	Display:
- Press H	(Select Function)
- Press **6**	

8. Clear memory channel

	Display:
- Select Memory mode	(** ******)
- Select the channel to be cleared	
- Press H	(Select Function)
- Press S	(Clear Channel?)
- Press H	(Processing)

9. Clear Priority (PR) Channel

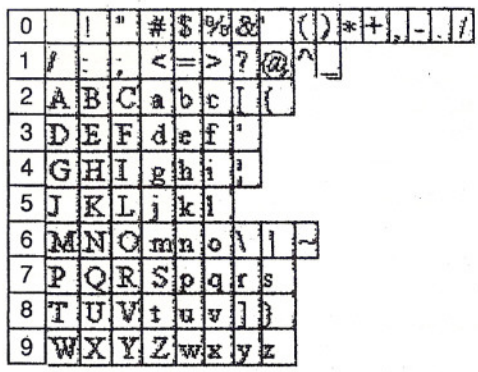
	Display:
- Select Prioruty Channel	(button F)
	(A ******)
- Press H	(Select Function)
- Press F	(Clear Calling?)
- Press H	(Processing)

10. Text entry

Text entry using the keys on the keypad is largely similar to the method used on GSM phones. For example, the letters A, B and C are 'behind' the number key '2'. The desired letter or character is selected by repeatedly pressing a number key.

The **B** button is used to delete a character. Text beyond the cursor position will shift back, just as with the DEL key when using a word processor. The **E** button is used to enter a space.
All characters behind the keys on the keypad are shown in the table below. The up and down arrow keys **C** and **D** may be used to step through a character group. The cursor may be moved by pressing the left and right arrow keys **F** and **G**.

On completion of text entry, press the H key.



11. Scanning

De transceiver is capable of scanning in Memory as well as in VFO mode:

To scan all frequencies:
- Switch to VFO mode by pressing the **G** button
- Press the * button

To scan memory channels:
- Select MEMory mode by pressing the **G** button
- Press the * button

Press any key to stop scanning. During scanning the red LED is illuminated.
If the transceiver has halted on a certain channel, scanning may be resumed by pressing * again.

During scanning indicator **F** is displayed.

12. Exclude channels from scanning

It is possible to skip certain memory channels while scanning.

	Display:
- Select MEMory mode	(** 43***)
- Select the relevant channel	
- Press H	(Select Function)
- Press *	

Indicator **E** shows that the channel is skipped during scanning.

To cancel this setting, perform the same keypresses in reverse order. The indicator will disappear.

13. Transmitter power

Transmitter output power is dependent on:
- The value set by the internal software
- Antenna matching
- Temperature

To set transmitter power:

	Display:
- Press **H**	(Select Function)
- Press **1**	

The transmitter power level may be adjusted by pressing keys **0** and **#** or **C** and **D**. Confirm desired level by pressing any other key.

14. Repeater shift setting

On the UHF radio, the default value for the repeater shift is 1.6MHz. On VHF, the default value is 600 kHz. The MENU allows any other value to be set up (see Heading 17).

To switch repeater shift on and off:

	Display:
- Press **H**	(Select Function)
- Press **#**	

Next there are 3 options:
- Shift off (43*.***.***)
- Shift negative (TX frequency 1.6MHz lower) (43*.***.*** –S)
- Shift positive (TX frequency 1.6MHz higher) (43*.***.*** +S)

15. Reverse shift

Reverse shift is useful for temporary listening on the repeater input frequency, and transmitting on the repeater output frequency.
Reverse shift may be switched on and off by pressing # only, i.e., without first pressing the **H** button. With reverse shift enabled, an 'R' is shown on the display instead of 'S'.

16. Squelch (trip) level setting

	Display:
- Press **H**	(Select Function)
- Press **2**	

The squelch level is then adjustable using the keys **0** and **#** or **C** and **D**.

17. The MENU

For lack of buttons on the FM1200/1100/1300, a number of less frequently used functions have been gathered into a Menu. Once in the menu, you can select between available options by means of the 0 and # keys.

Option values may be modified as required by pressing the **H** button. In that case, the indicator with the **H** key will be visible.

Options requiring a number or text to be set may also be edited using the **H** key. However, these entries need to be confirmed by pressing an unused key or the **H** key.

Access the menu as follows:

- Press **H**	(Select Function)
- Press **4**	(xxxxxxx MENU)

To keep the menu reasonably tidy, items have been distributed across submenus. The submenus may be viewed from the main menu by pressing the **H** button. Like the main menu, submenus are closed by pressing an unused key.

Available menu items:	**Options:**
- Shift	******** kHz**

Define amount of shift for repeaters. Adjust value using number keys.

- TX with SQ	**Possible / Not possible**

With 'Not possible' selected the transmitter can not be keyed while a signal is received.

- Limit TX time	****** sec**

Define maximum duration of transmission. Adjust value with number keys. 0 = none.

- Range	**430-440 / 300-500** **144-146 / 100-200**

Select VCO range. (UHF or VHF)

- Scan mode	**Wait for silence / Wait briefly / Scan until busy**

Indicates transceiver activity while in scanning mode.

- Scan mode	**Carrier / Squelch**

With 'Carrier' selected, the transceiver evaluates signal strength, this is faster. 'Squelch' is better for weak signals.

Audio	**Submenu!**
- Microphone	**Normal / PA**

The AF input may be sent to the loudspeaker output.

- Suppress	**Tones >500Hz / 1750Hz only / Never**

Suppress beep tones. Indicator C lights while suppressing.

- Beep **On / Off**
Keyboard beep.

- Beep **Volume: —**
Volume of keyboard beep.

- Roger beep **On / Off**
Transmit a beep on keying off the transmitter.

- DTMF tones ***** ms**
Define length of DTMF tones. Adjust value with number keys.

- ZVEI tones ***** ms**
Define length of ZVEI tones used for 5-tone calling. Adjust value with number keys.

Tone burst ***** Hz**
Define audio frequency used for opening repeaters.

Callsign generator **Submenu!**
- Callsign generator **On / On (hold TX) / Off**
The transceiver may transmit text in Morse. 'Hold TX' causes the transmitter to remain keyed until the text is finished.

- After call **On / Off**
Callsign may be transmitted immediately after 5-tone sequence.

- Callsign **<text>**
Define callsign transmitted during normal transmissions. See Heading 10.

- Callsign generator **Speed: *****
Define Morse speed (0-40).
Adjust value with number keys.

- Callsign generator **Only TX / TX & LSP**
Callsign may be sent to loudspeaker

- Callsign generator **After TX: *** sec**
Callsign generator is activated *** seconds after the transmitter is keyed. Adjust value with number keys.

- Callsign generator **Every: *** sec**
Callsign generator is activated every *** seconds. Adjust value with number keys.

User **Submenu!**
- LCD backlight **Off after: *** s**
LCD backlight is switched off automatically *** seconds after last action.

- My number *******
Define user's personal 5-tone code. The transceiver produces an alarm tone on reception of this code.

- Reply *******
This code may be transmitted when the personal code is received.

- Reply **Yes / No**
Enable/disable replying to personal code.

- Key acceleration **Accel.: X**
Define acceleration of up and down key. The longer the key is pressed, the faster frequencies will be stepped through.

- Keys **Repeat / Once**
If a key is held pressed, its function may be automatically repeated.

- Settings **Update / Fixed**
When 'Update' is selected, all settings are stored on switching off. 'Fixed' allows settings to be stored manually using the next menu item. When switched on, the transceiver employs the previously stored settings.

- Settings **Store**
This allows you to store settings.

- Memory **Copy now**
This allows the contents of the 24C65/64 EEPROM to be copied.

- <Language> **Nederlands / English / Deutsch**
Select one of three languages.

- Status **Diagnosis**
If the error indicator F is visible, the cause of the problem may be called up by pressing the H button.

18. Calls

The transceiver allows up to 10 different tone sequences to be stored. These tone sequences may be used to selectively call up stations.

Calling: *Display:*
- Press **H** (Select Function)
- Press **0** (Call:)
- Select the number/station to be called
- Press **#**

Defining the codes: *Display:*
- Press **H** (Select Function)
- Press **0** (Call:)
- Select the number/station to be called.
- Press **H** (Name:)
- Enter name, see Heading 10
- Press **H** to confirm (Nr.)
- Enter the number
- Press **H** to confirm

The **H** button is used to confirm entries. Cancel entry with any other key.

Appendix E. Frequently Asked Questions (FAQ)

Below is a list of questions we have been asked over and over again, together with the standard answers supplied.

1. My converted FM1200 does not generate tones, how come?
Step through the Status Menu (**H-5**). If you see: 'Tone CPU not active', you have either made an error in mounting the tone system PROM (32-pin PLCC 27C256R), or the wire link next to the tone CPU is not set to the 'ground' position. Check your solder work carefully using a continuity tester.

2. Is it possible to omit the tone PROM, it seems such a hassle to mount!
Sure, but you will be unable to use any of the functions that require tone processing (DTMF, CTCSS, 5-tone calling, 1750 Hz, etc.).

3. Can I use the FM1200 70cms for 9k6 packet radio?
We are not packet radio users but we're told that 9k6 is not possible because the varicap-based automatic RF tracking system inside the FM1200 will faithfully counteract any frequency change beyond normal deviation caused by modulation signals. 1k2 packet radio is possible without problems using a modem hooked up to the microphone connector.

4. Other stations tell me my deviation is too low, how can I adjust it?
They are probably listening in 25 kHz bandwidth. If yours is an 'S' FM1200, (examine the type number) then you can rely on it that the peak deviation has been accurately set to ±2.5 kHz by the factory, as required for 12.5 kHz channel spacing. Similarly the 'R' radio will produce ±4.0 kHz peak deviation, and may in rare cases require some reduction if used on 12.5 kHz spaced nets. Open up the microphone and check electret microphone front is clean and element is properly seated in its holder.

5. Does your conversion defeat the Philips PDP and CDP programming tools?
Yes. Having converted the radio it will no longer recognize the PDP or CDP.

6. Is your firmware and displayware suitable for 4-metre (E0-band) FM1000's?
No, it is not. The E0 band version of the FM1100/1200 radio is extremely rare in the Netherlands. An update may be developed in the future.

7. Is your firmware and displayware suitable for FM1000's with a 'basic' or 'standard' console?
No, it is not. The text and graphics used by the conversion exceeds the capacity of the 'standard' head, which only allows a number of fixed symbols to be used and does not have a numeric keypad. The 'basic' console does not even have a display so its use is out of the question. We suggest upgrading the radio by getting your hands on a numeric keypad head.

8. Where can I obtain the complete documentation of these wonderful radios?
A documentation package is available, consisting of (1) FM1100 Service manual, (2) Numeric Keypad Manual and (3) FM1200/1300 Service Supplement. The lot weights approx 1 kg. Price Euro 20 incl. P&P. Please contact Jan, PE1CSI on email pe1csi@amsat.org.

9. On my radio, the display test does not work to start with. I'm getting solid black blocks only.
This problem may be caused by a faulty or incorrectly fitted display EPROM, or LK4 (A15 jumper) in the display console being set to the wrong position. If the display EPROM is an 27C128 or 27C256, the centre pad of LK4 should be connected to +5V (left-hand position). If a 27C512 is used, LK4 should be connected to A15 (default position, right-hand).

10. I have just acquired an FM1000 radio at a local rally. Can I use it with your conversion?
This is the most annoying question we get. There is no such thing as an 'FM1000'. The designation FM1000 refers to a family of more than 50 different transceivers rather than an individual type. First do your homework by analysing the type code printed on the label at the rear of the radio. Use Appendix B for reference.

11. I have available a boxful of FM1000 parts and other Philips PMR bits, what should I do with it?
Contact Jan Buiting, PE1CSI, proprietor of the Philips Mobile Radio Collection, on email pe1csi@amsat.org. Jan will give you a Freepost address so you can turn your surplus into a donation to the Collection and pay no postage.

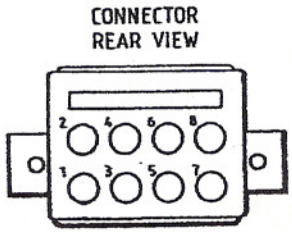
12. Is your firmware and displayware suitable for VHF or UHF FM1100's?
Not completely. Watch for postings in the [FM1000] Newsgroup, or [uk.amateur.radio].

the length of cable supplied for connecting to the socket of the Battery Lead Assembly(5). Using the loudspeaker bracket as a template, mark and drill two 3,4mm diameter holes. Secure loudspeaker with two No 10 self-tapping screws from the bagged items.

6. Push the two pins on the Loudspeaker (3) lead into pins 1 & 3 of the Battery Lead Connector as shown below. Note that the loudspeaker is not a polarity conscious item.

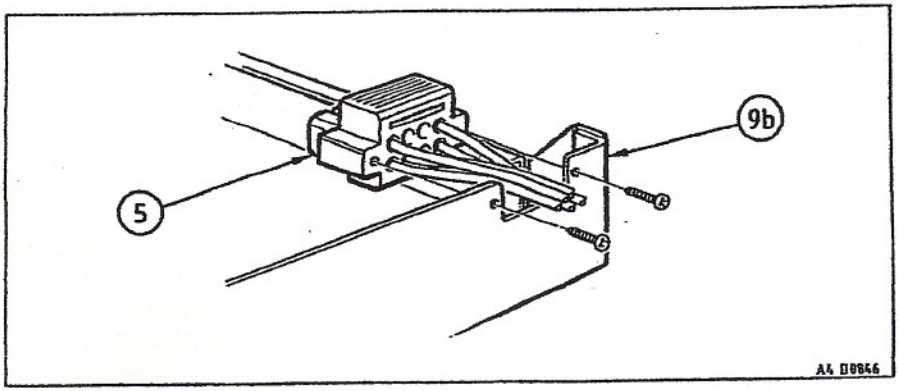
1. Loudspeaker (Live)	5. Remote Alarm
2. Battery (+)	6. External Alert
3. Loudspeaker (Ground)	7. Battery (-)
4. 0V	8. Ignition

NOTE: Observe loudspeaker polarity when connecting test equipment (eg AF power meter) to the radio.



7a. *Standard Mount Cradle only:*
Mate Battery Lead Assembly (5) to rear connector on radio (1).

7b. *Cassette Mounting Cradle only:-*
Secure the Battery Lead Assembly (5) to the rear of the cradle (9b) using two 2,5 X 10mm self-tapping screws from the bagged items.



FM 1200 WITH FULL KEY PAD.

TO SET POWER
PRESS GREEN BUTTON
PRESS 1; USE 3 OR 4 ON LEFT TO INCREASE OR DECREASE
PRESS GREEN TO RETURN

TO SET SQUELCH
PRESS GREEN BUTTON
PRESS 2; USE 3 OR 4 ON LEFT TO INCREASE OR DECREASE
PRESS GREEN TO RETURN

TO ENTER FREQ.
PRESS 07045 TO INPUT CALLING CHANNEL

TO CLEAR KEYPAD LOCK
PRESS RED BUTTON TWICE

TETRA COMMUNICATIONS

TETRA COMMUNICATIONS NORTHAMPTON.

INSTRUCTIONS TO SET FM 1200 WITH FULL KEYPAD.

SWITCH ON. WAIT FOR SET FREQUENCY TO FORM IN LCD.
"450.000.000" OR SIMILAR.
IF NOT 070.??? FOLLOW SEQUENCE BELOW TO RESET.
PRESS GREEN [H] to *SHOW "CHOOSE FUNCTION".*
PRESS 4 .. *"MENU".*
PRESS 0 UNTIL .. *"USER*
CHOOSE SUBMENU—→"
PRESS GREEN [H] .. *"USER"*
USE "0" TO SCROLL THROUGH OPTIONS TO *"LCD LIGHT:"*
PRESS GREEN BUTTON THEN "9" TO SET TO *"ALWAYS ON".*
PRESS GREEN [H]
PRESS "0" TO MOVE TO *"BAND:* *USER*
70CM"
USE GREEN [H] TO CHANGE TO *"2M"*
PRESS "0" *SHOWS "RECEIVER TYPE:* *USER*
USE GREEN [H[TO CHANGE FROM + TO – *FRX= FVCO – IF "*
SWITCH OFF
SWITCH ON
PRESS GREEN [H] *"CHOOSE SUBMENU → "*
PRESS "0" TO SCROLL TO *"WIDTH:* *MENU*
144 - 145MHZ *2M"*
PRESS GREEN [H] *"WIDTH* *MENU*
000 - 300 *2M"*
SWITCH OFF
SWITCH ON
PRESS 07045 TO SET TO 4M CALLING FREQUENCY *"070.450.000"*
KEY MIKE ON & OFF TO RECEIVE.
PRESS GREEN THEN 1 .USE "C" DOWN & "D" UP TO SET TRANSMIT POWER
PRESS GREEN[H] WHEN SET.
PRESS GREEN[H] THEN "2" USE "C" & "D" TO SET SQUELCH.
PRESS GREEN[H] WHEN SET

YOU HAVE SUCCESSFULLY RESET THE TRANSCEIVER

TETRA COMMUNICATIONS
VICTORIA CHAMBERS
1 VICTORIA ROAD
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NN1 5EB
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